have no guarantee that the inconsistencies will be reduced by this method: they may even be increased.

(*e*) We can only find by actual trial whether this is or is not the case. When we have tabulated the inconsistencies, we can very quickly test the effect of taking means of overlapping plates without performing any actual solutions. If the process is convergent, we can adopt the results to which it leads just as satisfactorily as we can take means between two plates in the first instance: if the process is not convergent, the first step is as wrong as any other; and we detect places where new meridian observations are *imperative* if any advance is to be made. Needless to remark, additional meridian observations will be always welcome and helpful; but they may not be immediately forthcoming.

Pogson's Observations of U Geminorum. Edited by H. H. Turner, D.Sc., F.R.S., Savilian Professor.

1. In 1904 April Mr Joseph Baxendell, of Southport, put into the writer's hands a number of MSS., notebooks and charts, representing the work of his uncle, Mr N. R. Pogson, on Variable Stars. Mr Baxendell found that he had not the leisure necessary to arrange the material for publication, and expressed the hope that the editing of Knott's and Peek's observations (*Memoirs R.A.S.*, vols. lii. and lv.) might be extended to Pogson's. A small grant from the Government Grant Fund enabled me to get the original notebooks copied out, as a safeguard against loss or injury, and the charts were photographed by Mr Bellamy and the originals deposited with the Royal Astronomical Society. But as yet I have made but little headway with the actual copy for press. The material requires more study than might be expected, some of it being very scrappy.

2. A recent announcement of a prize question on the variable U Geminorum, by the University of Utrecht, produced some inquiries for Pogson's original observations of this curious variable, and turned my thoughts in a new direction. Instead of trying to deal with the whole material at once, which would require at least several weeks' continuous attention, could the observations of individual stars be published separately? As an experiment, the observations of U Geminorum have been collected as below, and their immediate publication will in any case serve the good purpose of putting this valuable early material in the hands of those now undertaking a discussion of this remarkable star.

3. Pogson began to look for this star soon after Hind's discovery on 1855 December 15, and his first observation of it was dated 1856 March 26, when he makes this note:—

> The variable subject to strange fluctuations at intervals of 6 to 15 seconds, and quite to the extent of 4 mags. The neighbouring small stars were steady, not at all twitching like

the variable. The phenomenon (which was quite new to me) was watched for above half-an-hour with powers 54, 65, and 95. At times it quite vanished, and then surpassed the comparison star *a*.

On the next night, 1855 March 27, he notes:

Far from steady, but the pulsations much less marked than last night.

And he seems to have looked in vain for a repetition of the fluctuations of his first observation. Thus he notes on—

1857 April 15. A fine sky, but definition rather unsteady. U is certainly less steady than the neighbouring stars of less magnitude, but not in the marked manner previously observed.

1859 February 16. No extraordinary appearance different to neighbouring stars, except that it was rather less sharply defined than they were; the colour was a leaden white, not at all red.

With these exceptions the notes made are not of great interest. Many of them are simply "fine sky," or "moonlight," or "passing clouds"; and it seems unnecessary to encumber the record with them. Those likely to prove of value are here collected.

1857 April 7. The south 93 certainly brighter than the north.

1857 April 18. In a splendid sky, just suspected.

1857 October 30. Well compared: certainly on the rapid increase.

1864 September 28. Star 124 very little less than 113.

1866 April 16. Well seen and compared at 8 p.m. About 10½ p.m. decidedly brighter.

1868 November 17, 18. Either U or star 142 of Baxendell seen.

1870 January 17. Bright yellow; moon totally eclipsed.

4. The telescopes used by Mr Pogson at various times and places were as follows:—

At the Radcliffe Observatory, Oxford, to end of 1858.

Designation.	Aperture in inches.	Focus in inches.	
E	7·2	120	Equatorial at Radcliffe Observatory.
R	2·2	30	Ramsden portable telescope.
Dd	3·8	42	Dollond portable telescope.
SL	3·8	60	"Smythian" or "Lee": acquired from Adm. Smyth by Dr Lee of Hartwell, and lent by him to Mr Pogson in 1857 (Speculum Hartwellianum). Taken back to Hartwell in 1859 by Mr Pogson and used in his house. Apparently taken also to Madras by him. (*Madras Observations*, 1861, Oct. 4, p. 134.)

At the Hartwell Observatory, 1859 Jan. 1 to 1860 Dec. 31.

SL	3·8	60	As above.
H	5·9	102	Hartwell Equatorial.
Da	8·2	...	Mr Dawes' Equatorial at Haddenham.
B	10·0	144	Mr Barclay's Equatorial at Leyton.

At Madras, 1861 Feb. 8 onwards.

L	6·0	...	Lerebours Equatorial.
D	3·5	...	Dollond telescope.
S	8·0	...	Simms Equatorial.
SL	3·8	60	Smythian or Lee.

5. Many of the observations of U Geminorum in the first ten years are records of invisibility, with estimated superior limits; and to save space, these are collected in Table I.

TABLE I.

Dates in the Years 1856–1865 *when U Geminorum was looked for without success.*

Date.	Tel. Power.	Inferred.	Date.	Tel. Power.	Inferred.
1856.			1856.		
Jan. 2	E 54	<12	Nov. 26	E 93	$<13{\cdot}5$
27	R 40	<11	29	,,	$<13{\cdot}5$
	Maximum here.		Dec. 1	,,	$<13{\cdot}5$
			15	E 54	$<12{\cdot}0$
Apr. 2	?	$<13{\cdot}5$	24	R 40	$<11{\cdot}0$
4	?	<12	27	E 54	$<12{\cdot}7$
10	?	<12	29	E 93	$<13{\cdot}5$
12	?	$<d+0{\cdot}5$			
16	?	$<e+0{\cdot}5$	1857.		
20	R	$<11{\cdot}0$	Jan. 14	E 93	$<13{\cdot}0$
24	E		15	E 65	
May 10	,,	$<e+10$	16	,,	
13	,,	$<d$	27	,,	
20	,,	$<d$	29	,,	
22	,,	$<\begin{cases} f+1{\cdot}3 \\ e+1{\cdot}7 \end{cases}$	31	,,	
			Feb. 13	,,	
Sept. 3	R	$<11{\cdot}0$	14	,,	
Oct. 21	Dd	$<11{\cdot}0$	16	,,	
25	,,	$<11{\cdot}0$	20	,,	
Nov. 5	,,	$<11{\cdot}0$	23	,,	
8	,,	$<11{\cdot}0$	26	,,	

TABLE I.—*continued.*

Date.	Tel. Power.	Inferred.
1857.		
Feb. 28	E 65	
Mar. 3	,,	$< d$
4	E 95	$< f$
12	,,	$<13{\cdot}0$
13	,,	$<13{\cdot}0$
17	,,	$<13{\cdot}5$
20	,,	$<13{\cdot}5$
Maximum here.		
Apr. 18	E 95	$<13{\cdot}5$
May 5	E 65	$<11{\cdot}5$
Aug. 28	SL 90	$<11{\cdot}5$
Sept. 17	,,	$<12{\cdot}0$
18	,,	$<12{\cdot}6$
Oct. 1	SL 50	$<11{\cdot}0$
7	,,	$<11{\cdot}0$
8	,,	$<10{\cdot}7$
13	,,	$<12{\cdot}5$
16	,,	$<12{\cdot}4$
27	,,	$<12{\cdot}3$
Maximum here.		
Nov. 16	SL 50	$<12{\cdot}5$
18	E 95	$<13{\cdot}5$
28	E 54	$<13{\cdot}0$
Dec. 19	,,	$<13{\cdot}5$
1858.		
Jan. 9	SL 50	$<12\ 3$
11	,,	$<12{\cdot}5$
13	,,	$<12{\cdot}5$
18	,,	$<12{\cdot}5$
20	,,	$<12{\cdot}5$
21	,,	$<12{\cdot}5$
23	,,	$<12{\cdot}1$
25	,,	$<11{\cdot}5$
31	,,	$<11{\cdot}3$
Feb. 4	,,	$<12{\cdot}7$
7	,,	$<12{\cdot}5$
9	,,	$<12{\cdot}7$
15	,,	$<12{\cdot}1$
16	,,	$<12{\cdot}7$

Date.	Tel. Power.	Inferred.
1858.		
Feb. 19	SL 50	$<12{\cdot}5$
21	,,	$<11{\cdot}0$
28	,,	$<12{\cdot}3$
Mar. 5	,,	$<12{\cdot}7$
8	,,	$<12{\cdot}6$
9	E 96	$<13{\cdot}5$
11	SL 50	$<12{\cdot}5$
17	E 96	$<13{\cdot}5$
21	SL 50	$<11{\cdot}0$
22	E 54	$<11{\cdot}0$
26	,,	$<11{\cdot}2$
Apr. 1	SL 50	$<12{\cdot}0$
10	E 65	$<13{\cdot}6$
13	,,	$<13{\cdot}0$
15	,,	$<11{\cdot}0$
17	,,	$<11{\cdot}0$
23	,,	$>11{\cdot}5$
30	,,	$<13{\cdot}5$
May 3	SL 50	$<11{\cdot}5$
6	E 65	$<11{\cdot}0$
7	,,	$<12{\cdot}5$
11	,,	$<13{\cdot}0$
19	B 41	$<11{\cdot}3$
Sept. 12	SL 50	$<12{\cdot}5$
Oct. 8	E 65	$<13{\cdot}5$
Nov. 2	H 50	$<13{\cdot}5$
9	SL 74	$<12{\cdot}5$
Maximum here.		
Dec. 2	SL 100	$<12{\cdot}5$
26	SL 50	$<12{\cdot}0$
1859.		
Jan. 5	H 50	$<13{\cdot}5$
7	,,	$<13{\cdot}0$
12	,,	$<12{\cdot}5$
22	,,	$<13{\cdot}0$
26	,,	$<12{\cdot}1$
28	,,	$<13{\cdot}3$
Feb. 7	SL 50	$<12{\cdot}5$
Maximum here.		

TABLE I.—*continued.*

Date.	Tel. Power.	Inferred.
1859.		
Mar. 2	H 118	<13·5
7	H 50	<13·0
30	SL 50	<12·5
May 3	,,	<12·5
12	SL 74	<10·7
14	,,	<10·7
16	SL 50	<11·0
21	SL 74	<11·0
23	SL 50	<11·0
Aug. 29	H 66	<12·4
Sept. 4	SL 74	<12·1
Nov. 7	H 118	<13·0
21	H 50	<11·8
28	H 50	<13·0
30	H 118	<12·9
Dec. 1	,,	<13·0
3	,,	<13·0
5	,,	<12·9
8	,,	<12·2
14	,,	<13·0
21	,,	<13·0
26	H 84	<13·1
1860.		
Jan. 6	H 84	<12·3
16	,,	<13·0
20	,,	<13·0
27	,,	<13·0
31	,,	<12·8
Feb. 9	H 66	<12·6
13	H 50	<13·0
19	,,	<13·0
27	H 66	<12·7
29	H 50	<12·7
Mar. 9	SL 52	<11·3
15	SL 74	<12·3
18	H 50	<13·0
24	H 118	<13·0
26	H 66	<13·0
Apr. 2	H 118	<12·7
16	H 52	<12·0
1860.		
Maximum here.		
Aug. 22	H 50	<12·0
Sept. 12	H 52	<12·7
18	,,	<12·5
25	H 50	<12·5
30	SL 20	<10·5
Oct. 2	H 50	<11·0
3	H 50	<12·0
11	,,	<12·5
20	,,	<13·0
Nov. 1	H 50	<11·5
15	,,	<13·0
22	,,	<12·5
Dec. 20	B 40	<11·0
1861.		
Feb. 9	L 66	<13·0
13	,,	<13·0
14	D	<12·5
16	L 66	<13·5
28	,,	<13·0
Mar. 14	,,	<13·0
17	D	<12·0
18	,,	<12·3
22	L 66	<12·5
30	,,	<13·0
31	,,	<13·0
Apr. 1	,,	<13·0
2	,,	<13·0
5	,,	<13·0
9	D	<12·5
14	,,	<12·0
May 16	L 66	<10·5
Maximum here.		
Oct. 10	L 62	<10·5
27	SL 50	<12·4
29	L 62	<13·0
Nov. 15	L 77	<12·5
16	L 62	<12·5
18	,,	<12·5
23	,,	<12·5

TABLE I.—*continued.*

Date.	Tel. Power.	Inferred.
1861.		
Nov. 27	L 77	<13·0
Dec. 3	L 62	<13·2
6	SL 50	<12·7
9	L 77	<13·2
14	L 62	<12·8
17	,,	<12·8
23	L 77	<13·1
Maximum here.		
1862.		
Jan. 30	L 66	<13·0
Feb. 8	SL 50	<12·0
Mar. 22	,,	<12·5
27	L 66	<13·0
Apr. 4	,,	<13·0
9	,,	<12·5
17	,,	<12·9
23	,,	<12·5
24	,,	<13·0
May 1	,,	<13·0
20	,,	<13·0
23	,,	<13·0
Oct. 6	,,	<12·7
16	L 62	<12·7
Nov. 4	SL 74	<11·5
9	SL 52	<11·0
10	L 66	<11·7
25	,,	<13·0
Dec. 31	,,	<12·8
1863.		
Jan. 6	,,	<12·5
12	,,	<13·0
21	,,	<13·0
Feb. 6	,,	<12·8
12	,,	<13·0
22	,,	<13·0
Mar. 7	,,	<12·7
12	,,	<13·0
23	,,	<12·8
Maximum here.		
May 5	L 66	<13·0
Oct. 7	SL 50	<12·5
28	L 66	<12·5
Nov. 11	,,	<13·0
22	,,	<12·8
26	,,	<12·5
Dec. 7	,,	<13·2
22	,,	<12·7
Maximum here.		
1864.		
Jan. 2	L 164	<13·5
25	L 63	<12·5
Feb. 15 to 29	,,	<13·0
	,,	<12·9
Mar. 5	,,	<12·8
May 25	,,	<13·0
Maximum here.		
Oct. 4	L 164	<13·0
Dec. 6	L 63	<13·0
Maximum here.		
1865.		
Jan. 14	L 63	<12·8
25	,,	<13·1
Feb. 4	SL 52	<12·3
14	SL 74	<12·0
25	SL 52	<12·5
Mar. 2	,,	<12·4
19	L 63	<12·7
21	,,	<13·0
24	,,	<13·0
Maximum here.		
Sept. 26	L 63	<12·7
30	L 70	<13·0
Oct. 10	L 63	<13·0
?	,,	<13·0
Nov. 4	,,	<12·7
10	L 164	<13·0
30	L 63	<12·8
Dec. ?	,,	<13·0
14	,,	<13·1
23	L 70	<13·3

6. *Comparison Stars.*—Pogson kept a small MS. book labelled "Comparison Stars for Variables," in which usually the upper half of the page is devoted to those for one star and the lower half to those of another. Thus p. 17 is shared by R Cancri and V Piscium. But the whole of the opposite page (16) is devoted to the stars for U Geminorum, and some of the records are squeezed in margins, having obviously been added. The stars first adopted were *a*, *b*, *d*, *e*, *f*, *g*; then *c*, *h*, *e*, *l*, *m* were added in the margins, and finally new measures of *e*, *f*, *g*, *h* and the star *n* were squeezed in. No dates are given of the separate observations. When ten measures of any star had been secured, the mean was taken, and the star was thenceforward denoted by this magnitude, omitting the decimal point. Thus star *a* is often called 88, even in the original notebooks; and where it is called *a* in the notebooks it is copied out as 88. Sometimes the adopted magnitude of a star has been changed, and thus the same star is designated by different numbers at different times. Thus the magnitudes of *b* and *c* were at first taken as 9·3, and both stars designated by this number. Later the revised magnitudes were found $b = 92$, $c = 94$; and ultimately they were again changed to 93. Hence *the record of the original notebook is given in Table III. whenever possible*; but in some cases a doubt is inevitable. The original notebooks are not available before 1859. Search has been made for them, by the kind permission of the Radcliffe observer, at the Radcliffe Observatory, but so far without success.

There are some curious corrections and deletions, notably in the cases of stars *e*, *g*, and *h*, where ten large readings have been systematically struck out; but there seems to be no reason to restore them against Pogson's own judgment, though they are added at the end of the table. Those for *e* all come between the first and second series retained: those for *g* and *h* are interspersed among the separate members of the first set of ten retained.

[TABLE II.

TABLE II.

Pogson's Observations of Comparison Stars.

	a		*b*		*c*		*d*		*e*		*f*		
	9·0	9·0	9·3	9·5	9·5	9·5	10·2	10·2	11·1	10·8	11·4	11·3	11·3
	8·9	8·7	9·4	9·2	9·5	9·2	10·2	10·4	10·8	10·8	11·0	11·3	11·1
	8·7	9·0	9·1	9·6	9·0	9·5	10·2	10·4	11·0	10·7	11·3	11·2	11·4
	8·9	8·7	9·3	9·0	9·4	9·3	10·4	10·5	10·9	10·8	11·4	11·4	11·3
	9·0	8·8	9·1	9·2	9·5	9·5	10·5	10·3	10·6	10·9	11·0	11·2	11·3
	8·6	8·8	9·2	9·2	9·3	9·2	10·1	10·6	10·5	11·0	11·0	11·3	11·4
	8·6	8·7	9·2	9·2	9·3	9·1	10·3	10·5	10·9	10·6	11·3	11·5	11·3
	9·0	8·7	9·1	9·1	9·5	9·0	10·2	10·3	11·0	10·8	11·6	11·4	11·1
	8·7	8·5	9·2	9·4	9·2	9·4	10·1	10·5	10·7	10·6	11·2	11·2	11·1
	9·0	8·5	9·5	9·4	9·5	9·5	10·4	10·4	10·9	10·7	11·3	11·4	11·6
Means	8·84	8·74	9·24	9·28	9·37	9·32	10·26	10·41	10·84	10·77	11·25	11·32	11·29
Adopted	8·8		9·3		9·3		10·3		10·8		11·3		

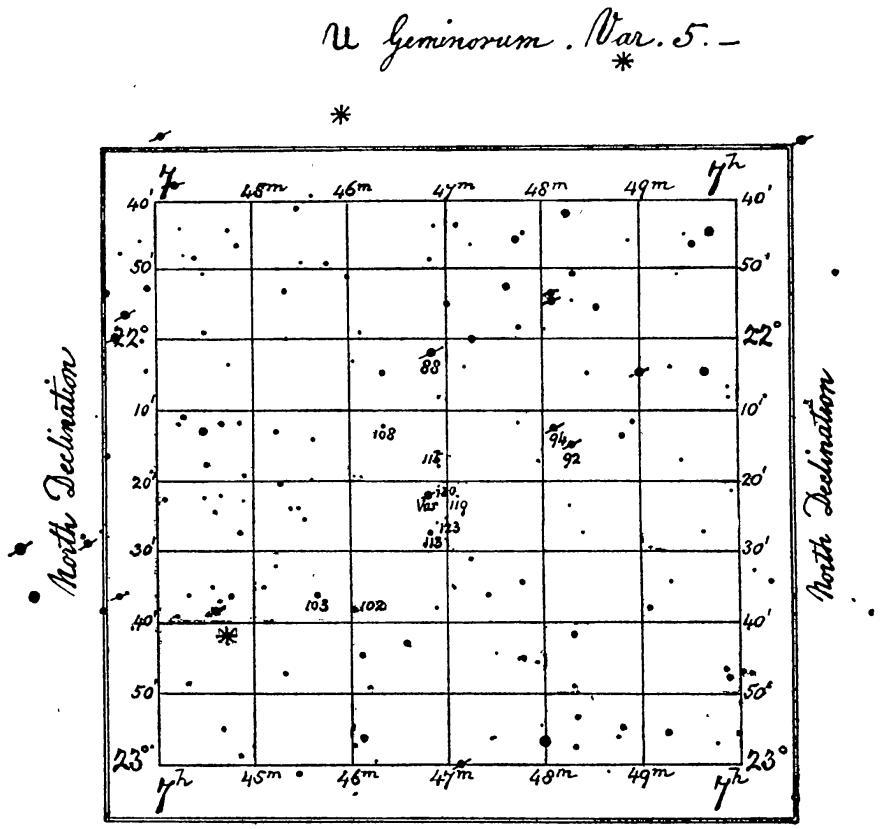
Readings struck out.

	g		*h*		*l*	*m*	*n*	*e*	*g*	*h*
	12·0	11·7	12·3	11·8	13·0	11·2	10·0	11·1	12·5	12·6
	12·0	11·6	12·2	12·5	13·0	11·3	10·1	10·8	12·1	12·5
	12·0	11·5	12·5	12·0	13·0	11·3	10·3	10·9	12·3	12·6
	12·0	12·0	12·2	12·4	13·0	11·5	10·2	11·1	12·2	12·5
	12·0	11·9	12·4	12·2	13·1	11·2	10·2	11·5	12·2	12·6
	12·0	11·9	12·0	12·3	13·1	11·3	10·3	11·1	12·3	12·6
	11·7	11·9	12·0	12·3	13·0	11·5	10·1	11·2	12·3	12·5
	12·0	12·0	12·4	12·5	12·9	11·4	10·2	11·0	12·6	12·6
	11·9	11·8	12·1	12·1	13·0	11·4	10·2	11·1	12·1	12·6
	12·0	11·9	12·3	12·5	12·9	11·3	10·1	11·1	12·5	12·5
Means	11·96	11·82	12·24	12·26	13·00	11·34	10·17	11·08	12·31	12·56
Adopted	11·9		12·3		13·0	11·3	10·2	...	...	...

7. From examination of Table II. the following identifications are suggested for the numbers by which Pogson indicates stars :—

88 or 89 = *a*; 92 = *b*; 93 = *b* or *c*;
94 = *c*; 102 = *n*; 103 = *d*; 108, 110, or 111 = *e*;
112 = *f*; 113 = *f* or *m*; 115 = *m*; 119, 120, or 121 = *g*;
123, 124, or 126 = *h*; 130 or 131 = *l*; 137 = ?

Pogson's diagram is reproduced with this paper, and the approximate positions given below are read from it. On reference to Mr Knott's diagram on p. 94 of *Memoirs R.A.S.*, vol. lii., it will be seen that he used practically the same stars, and a comparative table is given below.



Range: 9th to below 14th Magnitude.

Period. 97 Days.

Pogson. Diagram. No.	R.A.	Dec.	Letter.	Knott. Letter.	Mag.	R.A.	Dec.
	h m s	° ′				h m s	° ′
Var.	7 46 48	22 22	U	U	...	7 47 5	22 20
88	46 49	22 2	*a*	*a*	8·6	7 47 18	22 1
92	48 19	22 15	*b*	*c*	9·2	7 48 31	22 13
94	48 8	22 13	*c*	*b*	9·3	7 48 25	22 11
103	45 38	22 37	*d*	*d*	10·3	7 45 53	22 34
108	46 22	22 13	*e*	*e*	10·6	7 46 38	22 10
113	46 48	22 28	*f*	*f*	11·2	7 47 3	22 26
119	47 6	22 23	*g*	*g*	12·3	7 47 22	22 20
123	46 53	22 27	*h*	*h*	12·3	7 47 12	22 24
130	46 53	22 21	*l*	*k*	13·3	7 47 10	22 18
113	46 52	22 17	*m*	...	...	...	...
102	46 2	22 38	*n*	...	...	...	...
137	?	?	*k*?	*l*	13·7	7 47 0	22 22

8. This being premised, it seems the best course now to give simply *the original notebook record*, and this has been done in Table III. below. After 1865 the occasions when the star was looked for without success are comparatively few, and have been given in the ordinary form.

TABLE III.

Observations of U Geminorum near maximum 1856–1865; *and all observations* 1866–1881.

Date.	Tel.	Power.	Comparisons.
1856.			
Mar. 26	E	?	Est. 9·7 = 88 + 7 = 93 + 3 = 93 + 2
27	E	54	88 + 13 = 93 + 8 = 93 + 6 = 113 − 6
29	E	54	Est. 11·0 = 93 + 17
1857.			
Apr. 7	E	95	88 + 8 = 93 + 5 = 103 − 6
8	E	54	88 + 8 = 93 + 5 = 103 − 5
11	E	54	88 + 6 = 93 + 3 = 103 − 7
1857.			
Apr. 14	E	54	103 + 7 = 110 − 4 = 113 − 16
15	E	95	110 + 3 = 113 + 2 = 121 − 7 = 124 − 10
16	E	95	121 = 124 − 3
18	E	95	Invis. = < 13·5
Oct. 30	SL	50	9·7 ...
1858.			
Nov. 17	SL	50	93 + 5 = 103 − 3
18	SL	50	103 + 7 = 110 − 3 = 113 − 5

TABLE III.—*continued.*

Date.	Tel.	Power.	Comparisons.
1859.			
Feb. 16	H	50	$a+6=b=c-2=d-8$
17	SL	85	$a+3=b-2=c-2$
22	H	50	$a+2=b-3=c$
23	H	50	$b+3=c+1=d-7$
24	H	50	$b+6=c+5=d-4$
25	H	50	$c+15=d+6=f-4$
27	H	118	$f+10=g-1=h-4$
1860.			
Apr. 22	SL	50	$88+2=93-3$
24	SL	50	$a+3=b+2=c-2$
26	Da	66	$88+6=93$
27	SL	50	$88+10=93+5$
28	SL	50	$93+8$
30	H	52	$103+7=110-2$
May 1	H	52	$113+5=121-4$
2	Da	?	$121+4=130-7$
1861.			
May 2	L	66	$88+1=92-2$
3	L	66	$88+7=92+5=103-13$
4	L	66	$88+4=92$
5	L	66	$88+4=93$
6	L	66	$88+8=93+6$
7	L	66	$88+7=92+5$
8	L	66	$88+5=93+2$
9	L	66	$88+9=93+6$
10	L	66	$88+11=93+8=92+3$
12	L	66	$88+15=92+13=93+7=103-7$
14	L	66	$103+3=110-5$
16	L	66	Invis. $=<10\cdot5$
Dec. 23	L	77	Invis. $=<13\cdot1$
29	L	62	$103+2=110-5$
31	SL	50	$88+5=93-2$
1862.			
Jan. 2	SL	50	$88+2=93-3$
4	SL	50	$88+5=93-1$
5	SL	50	$88+7=93+1=103-5$
6	SL	50	$88+10=93+3=103-6$
8	L	62	$93+6=103-2$
10	SL	50	$103+2=110-3$
11	SL	50	$110-1=113-4$
18	L	77	$130+2$
1863.			
Apr. 8	L	66	$94+2=103-8$
9	L	66	$93+7=103-4$
10	L	66	$94+6=103-7$
11	L	66	$88+12=92+8=103-4$
12	L	66	$94+11=103-1=110-9$
13	L	66	$103+4=110-2$
14	L	66	$110+6=113+2=124-6$
15	L	66	$124+8=130-2$
17	L	164	$137+1$
Dec. 31	L	66	$124+2=130-4$
1864.			
Sept. 27	L	164	$110+6=112+2=121-5$
28	L	164	$121-1=124-5=113+7$
30	L	164	$130-1$
Oct. 4	L	164	Invis. $=<13\cdot1$
1865.			
Jan. 9*	L	63	$103+1=110-7$
14*	L	63	Invis. $=<12\cdot8$

* On opposite page of notebook is written "Looked in vain for U Geminorum on Jan. 12 and 13 (1865), but the moon was too bright to see even the well-known adjacent small stars." Is not observation of Jan. 9 possibly a wrong object?

TABLE III.—*continued.*

Date.	Tel.	Power.	Comparisons.
1865.			
Apr. 18	L	70	130 − 2
20	L	70	94 + 2 = 103 − 8
21	L	63	94 + 6 = 103 − 5
22	L	63	94 + 9 = 103 − 4
23	L	63	94 + 14 = 103 + 1 = 110 − 4
25	L	63	124 + 5 = 130 − 2
26	L	63	130 + 5
1866.			
Jan. 4	L	63	Invis. = < 12·5
14	L	70	Invis. = < 13·0
17	L	63	88 + 5 = 94 − 1 = 92 + 2
18	L	63	94 + 2 = 103 − 10
19	L	63	88 + 5 = 92 + 2 = 94 − 1
20	L	63	92 + 3 = 94 + 1 = 103 − 11
21	L	63	94 + 3 = 103 − 8
22	L	63	94 + 3 = 103 − 8
23	L	63	94 + 4 = 103 − 8
24	L	63	94 + 5 = 103 − 7
25	L	63	94 + 5 = 103 − 8
26	L	63	94 + 5 = 103 − 6
27	L	63	94 + 7 = 103 − 4
28	L	70	94 + 7 = 103 − 3
31	L	70	124 + 6 = 131 − 2
Feb. 1	L	164	Invis. = < 13·0
2	L	164	130 + 3 = 137 − 3
Mar. 21	L	63	Invis. = < 12·5
Apr. 6	L	63	Invis. = < 13·0
16	L	70	h + 8 = 130 − 4
16	L	70	h + 3 = 130 − 7
17	L	63	94 + 4 = 103 − 5
18	L	63	94 + 5 = 103 − 5
19	L	63	94 + 7 = 103 − 3 = 108 − 10
20	L	63	94 + 11 = 103 + 2 = 108 − 4
21	L	70	108 + 5 = 112 + 2 = 115 − 3
1866.			
Apr. 22	L	70	124 + 4
23	L	164	Invis. = < 12·8
May 14	63	63	Invis. = < 12·8
Nov. 3	S	45	Invis. = < 13·0
Dec. 25	S	86	Invis. = < 13·5
1867.			
Jan. 17	L	63	Invis. = < 13·0
23	L	63	Invis. = < 13·0
Mar. 8	S	86	Invis. = < 13·5
Oct. 26	L	63	Invis. = < 13·0
Dec. 14	S	86	88 + 10 = 93 + 5 = 103 − 6
15	S	40	93 + 5 = 103 − 8 = 88 + 10
16	S	40	93 + 7 = 103 − 3
17	S	86	n − 1 = 103 − 2
18	S	86	108 = m − 5
19	S	86	113 + 3 = 112 + 1 = 119 − 7
20	S	86	h + 1 = 130 − 6
21	S	86	130 + 1
22	S	86	130 + 5 = 137 − 1
23	S	163	equal 137
1868.			
Jan. 21	S	86	Invis. = < 13·7
Mar. 11	S	86	Invis. = < 13·0
Apr. 9	S	86	Invis. = < 13·7
18	S	86	Invis. = < 13·5
Nov. 17	S	105	137 + 3
18	S	86	137 + 3
Dec. 9	S	86	Invis. = < 13·5
1869.			
Jan. 6	L	66	Invis. = < 13·0
Feb. 20	S	86	93 + 4 = 102 − 7
21	S	86	93 + 5 = 102 − 4
23	S	86	93 + 7 = 102 − 4
24	S	86	102 + 4 = 108 − 2
27	S	102	< 12·8
Oct. 30	S	86	Invis. = < 14·0

TABLE III.—*continued.*

Date.	Tel.	Power.	Comparisons.
1870.			
Jan. 17	S	86	94+2=103−5
19	S	86	94+4=103−7
22	S	86	94+5=103−4
23	S	86	103−1
25	S	86	103+7=108+4 =113−2
26	S	86	119+3=123
27	S	86	130+1
Nov. 24	S	86	Invis. = <13·7
1872.			
Jan. 17	S	105	Invis. = <13·5
22	L	66	Invis. = <12·5
27	L	166	Invis. = <12·7
Feb. 1	L	166	Invis. = <13·7
6	L	66	Invis. = <13·5
11	L	66	Invis. = <13·7
16	S	...	Invis. = <14·0
21	S	105	93+15=103+2 =113−9
22	S	45	89+5=93
23	S	45	89+3=92
24	S	45	89+3=92−2 =94−4
25	S	45	89+5=92+2 =94
26	S	45	92+4=94+2 =103−9
27	S	45	92+3=94+2 =103−8
28	S	45	92+3=94+4 =103−8
29	S	45	92+6=94+4 =103−7
Mar. 1	S	45	92+7=94+6 =103−6
2	S	45	92+8=94+7 =103−4
3	S	45	92+12=94+10 =103−3
4	S	45	93+12=103−2 =108−6
5	S	45	103+2=108−4
6	S	90	108+4=113+1
1872.			
Mar. 7	S	90	123+3=130−6
8	S	90	130+2=138−6
9	S	90	=138
10	S	90	Suspected = <14·0
12	L	63	Invis. = <13·0
1873.			
Feb. 15	L	53	Invis. = <12·5
Mar. 27	L	53	Invis. = <12·7
1874.			
Jan. 14	L	106	Invis. = <13·0
Feb. 18	L	63	Invis. = <13·0
1875.			
Jan. 15	L	63	88+8=94+4 =102−7
16	L	63	88+10=94+4 =103−7
18	S	73	88+10=94+5 =102−4
19	L	63	88+12=94+5 =102−4
20	S	73	94+6=102−3
22	S	73	94+7=102−3
24	S	73	108+1=113−3
26	S	102	123+6=130−2
27	S	102	130+2=137−7
Feb. 1	S	99	130+7=137−2
?	S	120	<14·5 (suspected)
Dec. 18	L	67	Invis. = <13·0
1876.			
Jan. 13	S	89	Invis. = <13·0
1877.			
Jan. 4	L	61	Invis. = <12·7
Mar. 11	S	73	Invis. = <13·5
May 9	L	61	Invis. = <13·0
Oct. 13	S	73	Invis. = <13·0
1880.			
Jan. 2	S	72	Invis. = <13·0
1881.			
Mar. 23	L	65	Invis. = <12·7

Stellar Parallax Papers, No. 3.

The Parallax of Eight Stars, from Photographs taken at the Cambridge Observatory by Arthur R. Hinks, M.A., and the writer. By Henry Norris Russell, Ph.D.

The following results are derived from plates taken at Cambridge by Mr A. R. Hinks and the writer, and measured and discussed by the latter in the course of his work as a research assistant of the Carnegie Institution. A full description of the methods of observation and reduction is given on pp. 775–800 of the *Monthly Notices* for June 1905.

Table I. gives the relative parallax of these stars with respect to comparison stars averaging about the 9th magnitude. The last column but one gives the number of comparison stars for each series, and the preceding column the number of plates in the series. The same comparison stars were used for Nos. 2 and 3, which appear on the same plates, and similarly for Nos. 7 and 8. The two bright stars β and η Cassiopeiæ were photographed with a colour-screen, which reduced their photographic brightness by about $5\frac{1}{2}$ magnitudes.

TABLE I.

Ref. No.	Star.	R.A. 1900.0	Dec.	Mag.	P.M.	Parallax.	Plates.	Comp. Stars.	r_1.
		h. m.	° ′		″	″			″
1	β Cassiopeiæ	0 3·8	+58 26	2·4	0·55	+0·082±0·009	5	9	±0·014
2	Groombridge 34	0 12·6	+43 27	7·9	2·82	+0·250±0·012	6	9	±0·019
3	26 Andromedæ	0 13·5	+43 15	5·9	0·03	−0·026±0·041	6	9	±0·069
4	η Cassiopeiæ	0 42·9	+57 18	3·6	1·20	+0·188±0·021	7	8	±0·041
5	o Ceti	2 14·3	− 3 26	Var.	0·24	+0·136±0·035	7	9	±0·070
6	Lalande 25372	13 40·7	+15 27	8·5	2·32	+0·221±0·019	8	9	±0·032
7	Berlin B 5072	14 21·1	+24 6	9·0	1·42	+0·067±0·040	7	7	±0·073
8	Berlin B 5073	14 21·1	+24 6	9·1	1·42	+0·000±0·029	7	7	±0·052

The last column gives the probable error of a co-ordinate of each star, resulting from one plate, as derived from the least-square solution for the parallax. If we divide the stars into three classes according to their effective photographic brightness, we have three stars with faint images, Nos. 5, 7, and 8, four of moderate brightness, Nos. 1, 2, 4, and 6, and one star, No. 5, whose images are somewhat large and diffuse. The average values of the probable error of one plate for these three groups are ±0″·065 for the faint stars, ±0″·027 for those of medium brightness, and ±0″·069 for the bright star.

This emphasises the importance of proper exposure when we wish to secure highly accurate plates. It would have been well if the exposures for the three faint stars, which were made of the usual length (five minutes), had been lengthened.